

WHAT IS CLAIMED IS:

1. A filter element comprising:
 - (a) a media pack having first and second, opposite ends; said media pack defining a central open volume;
 - (b) a first end cap at said first end of said media pack; said first end cap having a central aperture in flow communication with said central open volume;
 - (i) said first end cap including an internally directed, radial seal region;
 - (c) a second end cap at said second end of said media pack; said second end cap having a central region;
 - (i) said second end cap central region being circumscribed by said media pack;
 - (ii) said second end cap central region including an annular wall with a projection segment; said projection segment:
 - (A) projecting into said central open volume from said second end of said media pack an axial distance of at least 6 mm; and
 - (B) becoming radially spaced no further than 50 mm from said media pack along a distance of inward axial projection of at least 6 mm; and
 - (iii) said second end cap central region including an axially outwardly projecting central projection.
2. A filter element according to claim 1 wherein:
 - (a) said media pack includes a cylindrical extension of pleated media.
3. A filter element according to claim 1 wherein:
 - (a) said media pack includes:
 - (i) a cylindrical extension of pleated media circumscribing said inner liner; and

- (iii) a cylindrical extension of non-woven depth media circumscribing said cylindrical extension pleated media.
- 4. A filter element according to claim 1 wherein:
 - (a) said central projection includes a circular base.
- 5. A filter element according to claim 4 wherein:
 - (a) said central projection comprises a frustoconical section.
- 6. A filter element according to claim 5 wherein:
 - (a) said second end cap includes an outer surface portion that is most recessed relative to remaining portions of said second end cap; and
 - (b) said frustoconical section projects axially outwardly from said most recessed outer surface portion by a distance of at least 5 mm and not greater than 100 mm.
- 7. A filter element according to claim 1 wherein:
 - (a) said second end cap comprises a two section composite including:
 - (i) a central, pre-form, having a bowl shape with:
 - (A) an outer, circular, wall;
 - (B) an annular rim projection radially outwardly from said outer circular wall; and
 - (C) a central base; said central base including said projection therein; and
 - (ii) an annular, molded, ring portion to which said media pack and said pre-form are secured.
- 8. A filter element according to claim 1 wherein:
 - (a) said media pack is cylindrical having a longitudinal axis through a center of the cylinder;

- (i) said longitudinal axis intersecting said central projection.
- 9. An end cover for an air cleaner; said end cover including:
 - (a) an inner side including a central projection thereon; said central projection:
 - (i) having a non-circular perimeter; and
 - (ii) comprising a wall no more than 20 mm thick and having a height of at least 10 mm and not more than 100 mm.
- 10. An end cover according to claim 9 wherein:
 - (a) said non-circular projection includes at least three vertices.
- 11. An end cover according to claim 10 wherein:
 - (a) said non-circular projection includes a polyhedron.
- 12. An end cover according to claim 11 wherein:
 - (a) said non-circular projection includes a regular polyhedron.
- 13. An air cleaner comprising:
 - (a) a filter element comprising: a first, open end cap; a second end cap; and a media pack extending therebetween;
 - (i) said first, open, end cap defining an internal radial seal region; and
 - (ii) said second end cap having a central region including a recessed portion having an outermost dimension of at least 125 mm and a recess of at least 6 mm; and
 - (b) an air cleaner access cover having an inner side including a central projection thereon; said central projection extending into said recessed portion at least 5 mm to support said filter element.
- 14. An air cleaner according to claim 13 wherein:

- (a) said central projection on said end cover comprises a wall no more than 20 mm thick and having a projection distance of at least 10 mm and not more than 100 mm.
- 15. An air cleaner according to claim 14 wherein:
 - (a) said closed end cap includes a projection extending axially outwardly from said central region and projecting into a volume circumscribed by said wall.
- 16. An air cleaner according to claim 15, wherein said filter element comprises a primary filter element; and wherein the air cleaner further includes:
 - (a) a safety filter element mounted in an interior of said primary filter element;
 - (i) said safety element having an open end cap, a closed end cap, a region of filter media therebetween.
- 17. An air cleaner according to claim 16 wherein:
 - (a) said safety element closed end cap includes a projection extending axially therefrom;
 - (b) said primary filter element defines a receiver in said central region of said closed end cap; and
 - (i) said safety element closed end cap projection extending into said receiver.
- 18. A filter element comprising:
 - (a) a cylindrical media pack defining a central open volume;
 - (b) a first end cap having a central aperture in flow communication with said central open volume;
 - (c) a second, closed, end cap having a central region closing an end of said media pack central, open, volume;
 - (i) said closed end cap including a frustoconical projection;

- (A) said frustoconical projection having a generally circular base with a diameter of at least 25 mm;
- (B) said frustoconical projection extending axially outwardly from said closed end cap at least 5 mm.

19. A filter element according to claim 18 wherein:

- (a) said first end cap includes an annular, externally directed radial seal portion.

20. A filter element according to claim 18 wherein:

- (a) said first end cap includes an internally directed, radial seal region.